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Appeal
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

Atty. Docket

PETER VAN DE WITTE et al.

PHN 15,815

Serial No. 08/857,756

Group Art Unit: 2877

Filed: May 15, 1997

Examiner: A. Merlino

Title: LIQUID CRYSTAL DISPLAY DEVICE, COMPENSATOR LAYER AND
METHOD OF MANUFACTURING A RETARDATION FOIL

Commissioner for Patents
Washington, D.C. 20231

Sir:

Enclosed is an original plus two copies of an Appeal
Brief in the above-identified patent application.

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Respectfully submitted,

By Norman N. Spain
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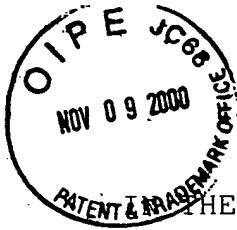
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APPEAL BRIEF

Sir:

This is an appeal from the Final Office Action of May 23,
2000. A Notice of Appeal was filed September 6, 2000.

REAL PARTY IN INTEREST

The real party in interest is the assignee, U.S. Philips
Corporation, a Delaware corporation. Philips Electronics N.V., a
corporation of the Netherlands is the ultimate parent of U.S.
Philips Corporation.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to the
Applicants or the assignee that would in any way directly affect or

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be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

The claims standing in this case are 1-15. Claims 1-14 are rejected. Claim 15 is withdrawn from consideration.

STATUS OF AMENDMENTS

The Rule 116 Amendment filed September 6, 2000 has been entered.

SUMMARY OF THE INVENTION

The invention as described on page 1, line 1-page 5, line 13 of the specification and as defined by the claims on appeal is directed to a liquid-crystal display device having a display cell comprising a layer of a nematic, liquid-crystal material between two, substantially parallel substrates and polarizers (Claims 1-8) and to a compensator layer comprising at least two retardation foils (Claims 9-14).

As shown on page 1, lines 1-16 of the specification, a liquid-crystal display device of the above-indicated type is described in United States Patent 5,210,630. According to this portion of the specification this patent shows such a liquid-crystal display device provided with a compensator foil consisting of an optically

anisotropic layer of a cholesterically ordered polymeric material, ordered in such a manner as to exhibit a molecular helix having its axis directed at right angles. The compensator foil is used to counteract discoloration in the display and to provide a high contrast.

However, as noted on page 1, lines 17-19 of the specification, such a display device is to a great extent angle-dependent. That is the contrast, as perceived by the viewer, is governed to a substantial degree by the angle or direction from which the display device is viewed.

As indicated on page 1, lines 20-23 of the specification, according to one aspect of the invention a novel display device of this type is provided in which the angle-dependence of the perceived is reduced to a considerable extent. As further indicated in this portion of the specification, according to another aspect of the invention a novel compensator layer is provided which compensator may be used in the display device of the invention.

As described on page 1, line 24-page 5, line 13 of the specification, and as defined by Claims 1-8, the novel display device of the invention has a display cell which, in addition to the layer of a nematic, liquid-crystal material provided between two substantially parallel substrates and polarizers, is also provided with at least two retardation foils which foils

predominantly contain polymerized or vitrified liquid-crystalline material, the liquid-crystal molecules of which exhibit a tilt angle relative to the substrates and the average directions of orientation of these liquid-crystal molecules in each of the retardation foils making an angle with each other in the range of between 60 and 120 degrees when viewed at right angles to the substrates.

According to a preferred embodiment of the invention, described on page 2, lines 24-27 of the specification, and defined by Claims 2 and 10, the direction of orientation of the liquid-crystal molecules is substantially constant in at least one of the retardation foils.

According to a further embodiment of the invention, described on page 2, lines 19-23 of the specification, and defined by Claims 3, 4 and 11, the tilt angle of the liquid-crystal molecules, in at least one of the retardation foils varies in a direction at right angles to the foil or may be substantially constant, as defined by Claims 5 and 12.

According to a preferred embodiment of the invention, described on page 7, lines 28-33 of the specification and defined by Claim 4, the average tilt angle of the liquid-crystal molecules in the retardation foils is at least 10 degrees, and more preferably, as defined by Claim 6, is between 10 and 70 degrees.

According to an additional preferred embodiment of the invention, described on page 4, lines 19-26 of the specification, and defined by Claims 7, 8, 13 and 14, the liquid-crystal molecules are provided, on one end, with a polar group and, on the other end, with a non-polar group. According to a further preferred embodiment of the invention, described on page 4, line 33-page 5, line 5 of the specification, and defined by Claims 8 and 14, the liquid-crystal molecules are covalently bound, through the non-polar groups, to the polymerized or vitrified material.

The invention is described in greater detail in page 5, line 14-page 10, line 7 of the specification and the figures of the drawing.

Fig. 1 is a cross-sectional view of part of a display device of the invention. In this figure a liquid-crystal cell comprises a twisted nematic liquid-crystal material 2 provided between two substrates 3 and 4 which are provided with electrodes 5 and 6, crossed polarizers 7 and 8 and compensator layer 9 formed of retardation foils 9^a and 9^b.

Fig. 2 shows part of the liquid-crystal cell of Fig. 1. Here, 11 shows the ideal orientation of the liquid-crystal molecules and 12 shows the normal orientation of these molecules. 13 is a viewing direction.

ISSUES

The issue in this case is whether Claims 1-14 are rejectable under 35 U.S. §103(a) as unpatentable over Ito et al.

GROUPING OF THE CLAIMS

Claims 1-14, all the claims on appeal are considered to be patentable for similar reasons and stand together.

THE ARGUMENT

The rejection of Claims 1-14 under 35 U.S.C. §103(a) as unpatentable over Ito et al. is considered to lack merit.

The Ito et al. patent is not considered to teach, or even suggest, the display device defined by even Claim 1, the most generic claim directed to a display device, and Claim 8, the most generic claim directed to a compensator layer.

Unlike the display device defined by Claim 1 and the compensator layer defined by Claim 8, the compensator layer of the Ito et al. patent has not been shown in the Ito et al. patent to be formed of at least two retardation foils, each predominately containing polymerized or vitrified liquid-crystalline material, the liquid-crystal molecules in this material having average directions of orientation in the retardation foils which makes an angle with each other, that ranges between 60 and 120 degrees and which molecules exhibit a tilt relative to a plane parallel to the

art retardation foils. It is not seen where the Ito et al. patent shows, or even suggests, such orientations for the liquid-crystal molecules of the compensatory sheets shown therein, which sheets the Examiner apparently considers to be the claimed retardation foils.

CONCLUSION

For reasons thus given, it is considered that the rejection of Claims 1-14 under 35 U.S.C. §103(a) as unpatentable over Ito et al. is considered to lack merit.

It is therefore requested that this Honorable Board reverse the decision of the Primary Examiner and allow Claims 1-14, all the claims on appeal.

Respectfully submitted,

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November 6, 2000

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Washington, D.C. 20231

On Nov. 6, 2000

By Norman N. Spain
Norman N. Spain, Reg. 17,846

APPENDIX

The claims on appeal are:

1. A liquid-crystal display device having a display cell which comprises a layer of a nematic, liquid-crystal material between two substantially parallel substrates, which display cell is further provided with polarizers, characterized in that the display cell comprises at least two retardation foils which predominantly contain polymerized or vitrified liquid-crystalline material comprising liquid-crystal molecules, the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material exhibiting a tilt angle relative to the substrates, and the average directions of orientation of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material of each of the retardation foils, making an angle with each other which ranges between 60 and 120 degrees, viewed at right angles to the substrates.

2. A liquid-crystal display device as claimed in Claim 1, characterized in that the direction of orientation of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material is substantially constant in at least one of the retardation foils.

3. A liquid-crystal display device as claimed in Claim 1, characterized in that the tilt angle of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material varies, in at least one of the retardation foils, in a direction at right angles to the foil.

4. A liquid-crystal display device as claimed in Claim 3, characterized in that, in the retardation foil, the average tilt angle of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material is at least 10 degrees.

5. A liquid-crystal display device as claimed in Claim 1, characterized in that the tilt angle of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material is substantially constant in at least one of the retardation foils.

6. A liquid-crystal display device as claimed in Claim 6, characterized in that, in the retardation foil, the tilt angle of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material is at least 10 degrees and at most 70 degrees.

7. A liquid-crystal display device as claimed in Claim 1, characterized in that the polymerized or vitrified material comprises liquid-crystalline molecules which are provided, at one end, with a non-polar group and, at the other end, with a polar group.

8. A liquid-crystal display device as claimed in Claim 7, characterized in that at the end provided with the non-polar group, the liquid-crystalline molecules are covalently bonded to the polymerized or vitrified material.

9. A compensator layer, characterized in that it comprises at least two retardation foils which predominantly contain polymerized or vitrified liquid-crystalline material comprising liquid-crystal molecules, the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material exhibiting a tilt angle relative to a plane parallel to the compensator layer, and the average directions of orientation of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material of each of the retardation foils making an angle with each other which ranges between 60 and 120 degrees, viewed at right angles to the plane parallel to the compensator layer.

10. A compensator layer as claimed in Claim 9, characterized in that the direction of orientation of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material is substantially constant in at least one of the retardation foils .

11. A compensator layer as claimed in Claim 9, characterized in that the tilt angle of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material varies in at least one of the retardation foils.

12. A compensator layer as claimed in Claim 9, characterized in that the tilt angle of the liquid-crystal molecules in the polymerized or vitrified liquid-crystalline material is substantially constant in at least one of the retardation foils.

13. A compensator layer as claimed in Claim 9, characterized in that the polymerized or vitrified material comprises liquid-crystalline molecules which are provided, at one end, with a non-polar group and, at the other end, with a polar group.

14. A compensator layer as claimed in Claim 13, characterized in that at the end provided with the non-polar group, the liquid-crystalline molecules are covalently bonded to the polymerized or vitrified material.